

REMARKS

Claim 1 is amended so as to specify that either silicon and/or boron is present in the claimed hard film at all times by specifying that it is present in an amount of from greater than 0 to less than or equal to 0.1 based upon atomic ratio. Claim 21 is added. Support for this amendment is found in the originally filed Claim 1. No new matter is believed to be introduced by the above-mentioned amendment.

Claim 4 is canceled. Therefore Claims 1-3 and 5-21 are pending. Favorable reconsideration is respectfully requested in light of the above amendment combined with the remarks below.

For clarity, the present inventors have found that a layer containing a specific combination of elements at specific proportions provide the layer with improved hardness and/or wear resistance. The present invention relates, in part, to a hard film for cutting tools containing $(\text{Ti}_{1-a-b-c-d}, \text{Al}_a, \text{Cr}_b, \text{Si}_c, \text{B}_d) (\text{C}_{1-e}\text{N}_e)$ where $0.5 \leq a \leq 0.8$, $0.06 \leq b$, $0 \leq c \leq 0.1$, $0 \leq d \leq 0.1$, $0 \leq c+d \leq 0.1$, $a+b+c+d < 1$, $0.5 \leq e \leq 1$ and a, b, c, and d denote respectively the atomic ratios of Al, Cr, Si, and B, and e denotes the atomic ratio of N and that at least one of c and d is larger than 0. Accordingly, the presently claimed invention now requires either the presence of Si and/or B at the claimed proportion of from greater than 0 to 0.1 atomic ratio.

The rejection of Claims 1, 3-9 under 35 U.S.C. § 102(b) over JP '831, JP '010, JP '105, JP '204, JP '901, JP '138, JP '127, USPN '734, USPN '768, USPN '928, and/or EP '498 is believed to be obviated by the above-mentioned amendment combined with the remarks below. Further, the rejection under 35 U.S.C. § 102(e) over USPN '797 and/or USPN '011 is believed to be obviated by the amendment combined with the remarks below.

It should be noted that none of the cited references above which are relied upon in the outstanding Office Action disclose or suggest a hard film for cutting tools containing Ti, Al, Cr, and N and/or C which further contains Si and/or B. Applicants thank the Examiner for

indicating the same in the Office Action because, as noted by the Examiner, Claim 2 of the present invention which requires that Si be present, is not rejected over the above-mentioned cited prior art by the Examiner. Further, nowhere can it be found in the above-mentioned references that B be present in place thereof Si.

In light of the above, it is clear that none of the above-mentioned references disclose or suggest the claimed hard film for cutting tools containing Ti, Al, Cr, and N and/or C which further contains Si and/or B. Accordingly, withdrawal of these grounds of rejection are respectfully requested.

The rejection of Claims 1-9 under 35 U.S.C. § 102(b) over JP '216, JP '215, JP '204, JP '205, JP '353, and/or USPN '830 is believed to be obviated by the above amendment combined with remarks below.

Further, the rejection of Claims 1-9 under 35 U.S.C. § 102(a) over JP '365 is believed to be obviated by the above-mentioned amendment combined with the remarks below. Finally, the rejection of Claims 1-9 under 35 U.S.C. § 102(e) over USPN '969, USPN '560, and/or JP '445 is believed to be obviated by the amendment above combined with the remarks below.

It should be noted that while the above-mentioned references may or may not disclose a film containing Ti, Al, Cr and N and/or C, these references clearly do not provide sufficient disclosure to a skilled artisan reading the same so as to enable the skilled artisan to envisage the claimed invention therefrom. Specifically, amended Claim 1 in the present application requires presence of Si and/or B at a proportion of from greater than 0 to 0.1 measured in atomic ratio. Meanwhile, all of the above-mentioned references provide merely a generic chemical formula in which Ti, Al, Cr and N and/or C may or may not be present. A genus does not always anticipate species within the genus, especially when the claimed species are not clearly named or envisaged by the generic disclosure (see MPEP 2131.02; Ex Parte A (17

USPQ2d 1716 (1990); and In re Petering (133 USPQ 275 (1962))). Such a broad generic chemical formulae, including broadly disclosed proportions of such elements therein, encompass a vast number and perhaps even an infinite number of compounds. Further, some, but not all, of these references specify that Si and/or B may or may not be added to their respective generic chemical formulae containing Si, Al, Cr, and N and/or C. Such generic teachings added to the generically disclosed chemical formulae therein provide even more ambiguity and lack of specificity for one of ordinary skill in the art to envisage the claimed harm film containing claimed proportion of Ti, Al, Cr, and N and/or C with either Si and/or B (a much more specific and narrow species set than that disclosed by the generic chemical formula of the above-mentioned references). Accordingly, the present application provides ample disclosure to enable the skilled artisan to draw the structural formula, including the specific proportions of each element therein, of the claimed layer, while the above-mentioned references fail to provide any such disclosure due to their generality of disclosure of generic chemical formulae.

The present situation is very similar to one which was decided by the Federal Court of Appeals in In re Petering (133 USPQ 275 (CCPA 1962)). In In re Pettering, the prior art disclosed a generic chemical formula. The Court held that this formula, without more could not anticipate a claim to a subgenus or species because the generic formula encompass the vast number and perhaps even an infinite number of compounds. However, the reference in In re Petering also disclosed preferred substituents in the compound which consisted of about 20 compounds within the generic chemical formula disclosed therein. While the court determined that the generic chemical formula disclosed in In re Petering could not anticipate the claimed subgenus, the more limited generic class which consisted of about 20 compounds did anticipate the claimed subgenus therein.

Like Petering, all of the above-mentioned references provide disclosures of only generic chemical formulae in which a vast number and perhaps even an infinite number of compounds may be present. Unlike In re Petering, all the above-mentioned references in the present case fail to provide a more specific preferred embodiment and/or exemplified embodiments that provide specificity towards the claimed hard film containing the claimed element at their claimed proportion, especially since the claimed invention now specifies that either Si and/or B must be present in a proportion that is greater than 0 to 0.1 atomic ratio.

In light of the above, it is clear that while the above-mentioned cited references provide a generic chemical formula in which a skilled artisan reading the same could not envisage the claimed invention, the same cited references fail to provide a more specific disclosure directing the skilled artisan toward the claimed invention. Therefore, it is clear that the present situation falls within the guidelines of the vision in In re Petering (except there is no more-specific disclosure in the present case); and therefore, the Office should withdraw all of the rejections based on the references cited above.

Further evidence that the above-mentioned references fail to disclose or suggest the claimed invention is provided in the multitude of exemplified embodiments demonstrating that the claimed invention is clearly superior to that disclosed in the prior art at pages 35 to 86 of the original specification.

The Examiner's attention is drawn to Table 3 at page 43 of the present application, which clearly demonstrates that Sample Nos. 1, 2, 3, 4, and 6, which do not meet the requirements of the present invention and fall within the broad scope of that disclosed by the references, are poor in either film hardness or oxidation starting temperature, while the samples that fall within the claimed invention which are Experiment Numbers 5 and 7 to 17 have superior high Vickers hardness as well as high oxidation starting temperature. Further, Table 4 at page 45 of the present application demonstrates that Sample No. 3, which does not

fall within the requirements of the present invention and falls within the scope of the general disclosure of the cited art, is inferior in wear resistance compared to samples that do fall within the claimed invention such as Sample Nos. 5, 8, 10, 12, 15 and 16.

In addition, Applicants direct the Examiner's attention to Table 7 at page 49 of the present specification. It is clear the Experiment No. 3 which contains the claimed elements within the claimed proportions, is superior to that which do not and fall within the generic disclosure of the cited references. Further, Experiment No. 3 contains silicon.

In addition, the Examiner's attention is directed to Table 8 at page 50, of the present specification. It is clear from this table that Sample Nos. 1-3 which are coated with a film containing boron in an amount specified in the present invention have a higher oxidation starting temperature and better wear resistance compared to that of Example No. 4 which does not contain the claimed elements at the claimed proportions but falls within the generic disclosure of the cited references.

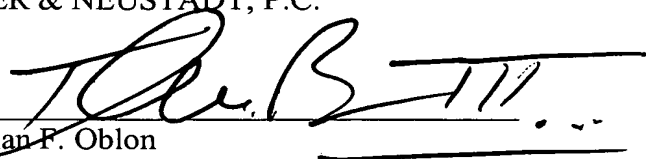
In light of the above, it is clear that none of the above-mentioned cited references in which the objections are based provide sufficient specificity for the skilled artisan to envisage or to be motivated to select the claimed invention therefrom, let alone appreciate the superiority of the claimed invention containing the claimed elements at the claimed proportions compared to compositions that do not contain the claimed elements at the claimed proportions. Accordingly, none of the above-mentioned cited prior art disclose or suggest the claimed invention. Accordingly, withdrawal of this ground of rejection is respectfully requested.

Application No. 10/025,653
Reply to Office Action of June 24, 2003

Applicants respectfully submit that the present application is now in condition for allowance. Early notice to this effect is respectfully requested. Should anything further be required to place this application in condition for allowance, the Examiner is requested to contact the undersigned by telephone.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read 'N. F. Oblon', written over a horizontal line.

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